

## ABSTRACT OF THE DISCLOSURE

The invention includes three-dimensional TFT based stacked CMOS inverters. Particular inverters can have a PFET device stacked over an NFET device. The PFET device can be a semiconductor-on-insulator thin film transistor construction, and can be formed over a conventional substrate (such as a monocrystalline silicon wafer) or a non-conventional substrate (such as one or more of glass, aluminum oxide, silicon dioxide, metal and plastic). The thin film of semiconductor material can comprise both silicon and germanium. Further, the thin film can contain two different layers. A first of the two layers can have silicon and germanium present in a relaxed crystalline lattice, and a second of the two layers can be a strained crystalline lattice of either silicon alone, or silicon in combination with germanium. The invention also includes computer systems utilizing such CMOS inverters.